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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/925,275	08/09/2001	Christopher Naunheimer	106056	4216

23490 7590 01/30/2004

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EXAMINER

MCHENRY, KEVIN L

ART UNIT	PAPER NUMBER
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1725

DATE MAILED: 01/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AS

Office Action Summary	Application No. 09/925,275	Applicant(s) NAUNHEIMER ET AL.	
	Examiner Kevin L McHenry	Art Unit 1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 8/9 & 6/13. 6) ☐ Other:

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claim 17 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 8, 9, 13, 16, and 19 of copending Application No. 09/925,261 in view of Kilian (U.S.P. 3,738,090).

Claims 8, 9, 13, 16, and 19 teach the invention cited in claim 17 except that the cyclone inlet has a short side and a long side with the short side being substantially tangential to a cross-sectional profile of a gas recovery conduit.

Kilian teaches a particle separation process in which a cyclone has an inlet with a short side and a long side with the short side being substantially tangential to a cross-sectional profile of a gas recovery conduit. Kilian teaches that this design allows particles to enter conduits along undisturbed trajectories without wall collisions and that this design results in a smooth, non-turbulent expansion of gases (see U.S.P. 3,738,090; particularly Figures 1 and 5; column 1, lines 4-8; column 2, lines 9-17, 22-26, 38-40; column 3, lines 58-63).

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It would have been obvious to one of ordinary skill in the art at the time that the applicant's invention was made to have modified the process cited by claim 17 by the teachings of Kilian. One would have been motivated to use a cyclone that allows particles to enter conduits along undisturbed trajectories without wall collisions and has a design that results in a smooth, non-turbulent expansion of gases, as taught by Kilian.

This is a provisional obviousness-type double patenting rejection.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-6, 10, and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claim 1 recites the limitation "the catalyst particle concentration" in line 6 of claim 1. There is insufficient antecedent basis for this limitation in the claim. For examination purposes the examiner interpreted this language to mean "a catalyst particle concentration".

6. Claim 1 recites the limitation "the gaseous fluids concentration" in lines 6-7 of claim 1. There is insufficient antecedent basis for this limitation in the claim. For examination purposes the examiner interpreted this language to mean "a gaseous fluids concentration".

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7. Claim 6 recites the limitation "said first angular direction" in lines 1-2 of claim 6.

There is insufficient antecedent basis for this limitation in the claim. For examination purposes the examiner interpreted this language to mean "a first angular direction".

8. Claim 13 recites the language "said cyclone inlet. the cyclone" in lines 3-4 of claim 13. This language is indefinite because it is unclear what is meant by "the cyclone" after the cyclone inlet has been cited. For examination purposes the examiner interpreted this language to mean "said cyclone inlet."

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1-16 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niewiedzial (U.S.P. 5,565,020) in view of (U.S.P. 3,738,090).

Niewiedzial teaches a fluidized catalytic cracking process in which hydrocarbon feedstock and solid catalyst particles are fed into a reaction conduit to form a mixture, the mixture is induced into a swirl by passing through tubular swirl arms and into a gas recovery conduit and separation vessel, and the mixture is then fed directly from the gas recovery conduit to a cyclone. Stripped catalyst particles and gases are collected from a stripping zone in the separation vessel. The swirl arms curve about an axis that is parallel to the reaction conduit and the openings of the swirl arm define a swirl direction

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toward the outer of the cyclone. The cyclone has a centrally disposed gas outlet (see U.S.P. 5,565,020; particularly Figures 1-5; column 1, lines 13-26; column 4, lines 34-67; column 5; column 6, lines 1-40).

Niewiedzial does not teach that the inlet to the cyclone has a short side and a long side with the short side being substantially tangential to cross section of the gas recovery conduit.

Kilian teaches a particle separation process in which a cyclone has an inlet with a short side and a long side with the short side being substantially tangential to a cross-sectional profile of a gas recovery conduit. Kilian teaches that this design allows particles to enter conduits along undisturbed trajectories without wall collisions and that this design results in a smooth, non-turbulent expansion of gases (see U.S.P. 3,738,090; particularly Figures 1 and 5; column 1, lines 4-8; column 2, lines 9-17, 22-26, 38-40; column 3, lines 58-63).

It would have been obvious to one of ordinary skill in the art at the time that the applicant's invention was made to have modified the process of Niewiedzial by the teachings of Kilian. One would have been motivated to use a cyclone that allows particles to enter conduits along undisturbed trajectories without wall collisions and has a design that results in a smooth, non-turbulent expansion of gases, as taught by Kilian.

11. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Niewiedzial (U.S.P. 5,565,020) in view of (U.S.P. 3,738,090) as applied to claims 1-16 and 18-20 above, and further in view of Van Tongeren (U.S.P. 2,039,692) or Syred et al. (U.S.P. 4,634,456).

The former references teach the process described above in section 10. However, these references do not teach that the swirl arms curve in a direction counter to the orientation of the cyclone's outer wall.

Van Tongeren teaches a process for separating particles from air in which a cyclone is designed so that it induced a swirl in a direction counter to the first swirl direction of the mixture. Van Tongeren teaches that this process is highly efficient at separating the particles and has the same efficiency as a very large direct-type cyclone while having a lower resistance (see U.S.P. 2,039,692; particularly Figures 7-8; column 1, lines 17-33; column 4, lines 28-45).

Syred et al. teach a process for separating particles and gases in which a secondary chamber induces a swirl direction that is counter to the swirl direction of a first chamber. Syred et al. teach that this allows improved grading of the particles by size (see U.S.P. 4,634,456; particularly Figures 5a and 5b; column 1, lines 6-17, 32-51, 57-58, 67-68; column 2, lines 1-6; column 4, lines 7-28).

It would have been obvious to one of ordinary skill in the art at the time that the applicant's invention was made to have modified the process taught above by the teachings of Van Tongeren or Syred et al. One would have been motivated to do so in order to provide a cyclone that is highly efficient at separating the particles and has the same efficiency as a very large direct-type cyclone while having a lower resistance, as taught by Van Tongeren, or to provide a separation chamber that allows improved grading of the particles by size, as taught by Syred et al. In light of these teaches of producing cyclonic swirls in a counter direction, one of ordinary skill in the art would

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have recognized that the swirl arms of the process noted above would be aligned in a direction counter to the outer wall of the cyclones.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kemp (U.S.P. 4,482,451), Goodspeed et al. (U.S.P. 5,518,695), Myers et al. (U.S.P. 4,066,533), Cartmell (U.S.P. 4,394,349), Myers (U.S.P. 4,070,159), Kovacs et al. (U.S.P. 4,843,051), Haddad et al. (U.S.P. 4,605,491), and Tammera et al. (U.S.P. 5,190,650) are cited of interest for illustrating the state of the art in separator and cyclone design.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin L McHenry whose telephone number is (571) 272-1181. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas G Dunn can be reached on (571) 272-1171. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1234.



Kevin McHenry

Kiley Stoner AU 1725
Kiley Stoner 1/26/04